

## **Geosciences Node**

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**Washington University in St. Louis**

**PDS Management Council Face-to-Face  
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# Archive Development Highlights

Mission Involvement (Geosciences-led missions in bold)

- **Mars Odyssey**
- **MER (Mars Exploration Rover)**
- **Mars Express (European Space Agency orbiter)**
- MESSENGER (Mercury orbiter)
- **MRO (Mars Reconnaissance Orbiter)**
- **LRO (Lunar Reconnaissance Orbiter)**
- **MSL (Mars Science Laboratory, Curiosity rover)**
- **GRAIL (lunar orbiter)**
- **InSight (Mars lander)**

# Archive Development Highlights: Active Missions

## Upcoming releases

- June 1, 2014 – GRAIL Release 5
- June 2, 2014 – MRO Release 29
- June 9, 2014 – MER Release 40
- June 15, 2014 – LRO Release 18
- July 1, 2014 – Odyssey Release 48
- August 1, 2014 – MSL Release 6
- Sept. 5, 2014 – MESSENGER Release 12

## Current peer reviews

- LRO Mini-RF Global Mosaics, April 14 – May 30, 2014
- MRO SHARAD Radargrams, April 14 – May 30, 2014
- MRO CRISM MTRDRs (Map Projected Targeted RDRs), April 15 – May 14, 2014
  - New highly derived product
  - Will be our most popular CRISM product yet
  - Map projected, co-registered short and long wavelength sensors with atmospheric and photometric corrections

# Archive Development Highlights: Developing Missions

## InSight

- Launch March 2016, first release Feb. 2017
- Nodes involved: Geo (lead), Atmospheres, Imaging, NAIF, PPI
- Version 1.2 of the Information Model contains Product\_Native to be used for archiving the raw seismic data in SEED format
- Near-term schedule
  - April 30, 2014: First drafts of documents and PDS4 labels
  - May, 2014: Coordination of PDS4 work among nodes
  - August – October 2014: Peer reviews for raw data archives
- Things to watch out for
  - Multiple data delivery paths
  - Many data providers are new to PDS

# Archive Development Highlights

## Restorations

- Viking Lander seismic data, Ralph Lorenz, APL
- Magellan stereo derived topography, Robert Herrick, U. Alaska
- Magellan raw radio science, Dick Simpson, Alex Konopliv, and others

## Non-mission data providers

- Earth based S-band lunar radar, Bruce Campbell, Smithsonian

# Data Holdings and Deliveries

- Current Data Holdings as of April 1, 2014
  - 147.9 TB archived at the Geosciences Node (all PDS3)
  - 228 data sets on 4,830 archive volumes
  - 29,772,000 files
- Expected Deliveries April 2 through October 1, 2014
  - 11 deliveries for 43 data sets from 7 missions
  - ~ 5 TB (more if SHARAD resumes deliveries)
- Approximate growth rate of Geo archives: 20 TB per year through FY19
- NSSDC Deliveries
  - 4,013 volumes archived at NSSDC
  - 693 volumes to be delivered in 2014
  - At least 10 volumes to be delivered in 2015

# User Services: Analyst's Notebook

- Maintain Analyst's Notebooks for MSL, MER, Phoenix, LCROSS, and Apollo
  - Team versions for MSL and MER are provided as a service to the science teams and to ensure very detailed validation
- Data updates in Notebooks coincide with archive releases
- New MER Notebook release, March 2014
  - Incorporates features developed for the MSL Notebook, such as cart-based orders, map-based search, user history and bookmarks
  - Includes updated back-end processes, web service technology
- Continue to add features and functionality based on user feedback, such as better tracking from target names to products

# User Services: Orbital Data Explorer

- Updated ODE with newly released data from MRO, MEX, Odyssey, LRO, and MESSENGER
- Added GRAIL to ODE
- Released ODE V3.4
  - New query parameters (Emission, Incidence, Phase Angles and Solar Longitude)
  - Updated specialized CRISM queries to support new observation modes
  - Updated ODE back-end processing to improve performance and support ODE's REST interface
- Released ODE REST Web-Based Interface V1.1
  - Allow science users at NASA Ames to access ODE's LOLA RDR query tool directly from their LROC processing pipeline.



# User Services: Forums

- Forums at [geoweb.rsl.wustl.edu/community/](http://geoweb.rsl.wustl.edu/community/)
  - Announcements
  - For Data Providers
  - For Data Users
- Moderated; anyone can view; must register to post
- We post answers to questions we receive by email
- Example questions:
  - How to use MRO CRISM CAT software?
  - How to read MRO SHARAD binary files?
  - How to read MSL ChemCam LIBS spectral data?

# User Services:

## Workshops at LPSC, March 2014

- MSL ChemCam Workshop
  - Approximately 40 attendees
  - Geo Node presentation devoted to getting data from PDS
- MRO SHARAD / Mars Express MARSIS Workshop
  - Approximately 40 attendees
  - Geo Node presentation on acquiring data from PDS, with a focus on finding data using the Orbital Data Explorer
- LRO Data Users' Workshop
  - About 12 to 15 attendees (day-long workshop; people came and went)
  - Geo Node presentation on acquiring data from PDS, with a focus on finding data using the Orbital Data Explorer
  - Instrument presentations also touched on techniques for downloading data from PDS
- MASCS VIRS Users' Workshop
  - 24 attendees
  - Geo provided a set of slides with detailed instructions for downloading MASCS data from PDS
- All presentations are or will soon be online at [pds-geosciences.wustl.edu/workshops](http://pds-geosciences.wustl.edu/workshops)

# User Services: Geosciences Node at LPSC

## Geosciences Node Booth at LPSC

- Attendees asked detailed questions about using PDS data and Geo Node services.
- ODE map interface and map location searches were popular requests for demonstrations.
- Many questions were related to opening PDS products and working with them in other applications.
- Some users expressed interest in using ODE REST services for querying the ODE data base and acquiring products.
- Wish list: additional tutorials, tools for viewing PDS products, tools for converting PDS format to other formats

Analyst's Notebook and ODE LPSC abstracts and posters were presented

# PDS4 Migration in 2014

- Complete Phoenix archive migration, in cooperation with Atmospheres and Imaging Nodes
  - Include Robotic Arm (completed), TEGA (Thermal Evolved Gas Analyzer) and MECA (Microscopy, Electrochemistry and Conductivity Analyzer) archives
  - Work with Atmospheres and Imaging Nodes to create a complete mission data dictionary

# Security

- Disaster Recovery Plans/Updates
  - Regular onsite and two offsite backups are performed in accordance with our Data Protection Policy.
  - Regular updates are made to our Disaster Recovery Plan.
- IT security planning
  - Regular updates are made to our Security Policy.
  - Recently participated in a campus-wide IT security audit.
  - Recently configured additional firewall security measures to identify and prevent cyber attacks.
  - Our firewall blocks an average of one thousand cyber threats per month.
  - Deployed system to send email alerts to IT staff in the event of potentially serious cyber attacks.

# PDS4 Development Effort

- Staff time supporting DDWG activities including tiger teams: ~ 20% of Guinness' s time
- Staff time supporting CCB: ~ 10% of Stein' s time
- Staff time developing PDS4 designs for InSight: ~ 5% of Slavney' s time
- Staff time installing registry software (a one-time task): 8 hours

# Plans 2015-2019

- Challenges for PDS4
  - How to describe map projections in a PDS4 label? Map software developers are waiting for this.
  - How to open and view PDS4 data products? Users need application programs that open, display, and convert data products. Software libraries alone are not enough.
- Tools needed for PDS4
  - Label editor
  - Search tools
  - Reporting and metrics tools
    - Amount and location of data
    - User metrics
- Geosciences Plans
  - Re-design web site based on a Content Management System
  - Continue to improve ANB and ODE to meet user needs